PDR RID Report

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Section **Page** **Figure Table**

Category Name I&T **Actionee** Project & HAIS

Sub Category

Subject Randomness in stress testing

Description of Problem or Suggestion:

Stress testing using inputs that are too similar and/or repetitive often fails to simulate stresses adequately due to caching. Two examples are database load tests where identical queries run faster than expected due to RDBMS caching, and data servers where data for identical requests come from disk cache instead of tape.

Originator's Recommendation

Investigate ways to:
(a) ensure enough variability to produce realistic stresses, and/or
(b) detect whether the test element is making excessive use of caching to satisfy stress testing

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GSFC Response by: Glenn Iona **GSFC Response Date** 7/25/95

The ESDIS Project concurs with the HAIS response provided below.

In addition, the ESDIS SI&T contractor, will be developing EOSDIS test plans & scenarios that will utilize the Mercury XRunner/LoadRunner tools. The ESDIS SI&T contractor has observed the effects of disk caching in their evaluation of the V0 IMS. They plan to further characterize:
- the persistence of cached data to user sessions
- memory & disk space allocated to RDBMS caching to identify tests that can flush or overwrite the cache
- impact of caching on response times for repeated queries.

As part of their scenario development they will apply controlled heterogeneous transaction loads using the following methods to measure performance:
- Sustained Loads - heavy load of heterogeneous transactions
- Peak Loads (LoadRunner Rendezvous test) - simultaneous service requests for a variety of services.
- Convergence - Same as peak except only one type of service is requested.

During these test performance data on memory, CPU, network, disk, system response times, and disk caching will be collected.

For additional information on how the ESDIS SI&T contractor will perform stress testing please contact the ESDIS SI&T Manager Janice Smith at 286-4800 or janice.smith@gsfc.nasa.gov. The following Technical Analysis Memorandums are available from the IV&V WWW Home Page; http://fairmont.ivv.nasa.gov/cgi-bin/library/library.sh or from Pete VanWie, IV&V/CTA, at 301 982-5414 or phv@cclink.gblt.inmet.com.

HAIS Response by: Forman **HAIS Schedule** 2/28/95

HAIS R. E. **HAIS Response Date** 5/18/95

We have acquired the Mercury Xrunner and Load runner tools for use in adressing both regression testing and stress or performance testing. We will address the issue of variability in stess testing in two ways. First the Xrunner tool allows us to record user sessions and then modify the recorded script to provide iteration and variability in data inputs. Second, the Loadrunner tool allows us to create multiple virtual users and use the virtual sessions concurrently to apply a controlled load to the systems under test. The Loadrunner virtual sessions can be replications of the same types of activities or totally different activities applying load to the system in a variety of ways. We will to the degree possible create loads that simulate the variety of uses that our expected large and varied user community will bring to the real systems. In addition we plan to monitor our tests using the HP Openview systems management tool to gain insight into the effects of systems components on system performance.

Status **Closed** **Date Closed** **7/26/95** **Sponsor** **Herring**

****** **Attachment if any** ******

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